

Termination of a Contract or portion thereof shall not relieve the Contractor of any contractual responsibilities for the work completed, nor shall it relieve the surety of its obligation for and concerning any just claim arising out of the work performed.

## **SECTION 109 MEASUREMENT AND PAYMENT**

### **109.01 MEASUREMENT OF QUANTITIES.**

All work completed under the Contract will be measured by the Engineer according to United States' standard measure.

- A. Longitudinal measurements for area computations will be made horizontally, and deductions will not be made for individual fixtures having an area of 9 square feet or less. Transverse measurements for area computations will be the dimensions shown on the Plans.

Miscellaneous items which are placed on slopes will be measured by the square yard on the slope.

- B. Structures will be measured according to lines shown on the Plans or as altered to fit field conditions.
- C. All items measured in linear units such as pipe culverts, guardrail, underdrains, etc. will be measured parallel to the base or foundation upon which the structures are placed.
- D. In computing volumes of excavation, the average end area method, prismatic method, or other acceptable methods will be used.
- E. The term "ton" will mean the short ton consisting of 2,000 pounds. All materials measured or proportioned by weight will be weighed on accurate, approved scales at locations designated by the Engineer. If material is shipped by rail, the car weight may be accepted provided only actual weight of material will be paid for. Car weights will not be acceptable for material processed through mixing plants. Trucks used to haul material will be weighed empty at times directed by the Engineer, and shall bear a plainly legible identification mark.
- F. Materials measured by volume shall be hauled in approved vehicles and measured at the point of delivery. Vehicles may be of any size or type, provided the body is shaped so the actual contents may be readily and accurately determined. All vehicles shall be loaded to their water capacity where possible. The Engineer may require the loads to be leveled at the delivery point to determine that actual volume of the load. Vehicles shall not haul loads that exceed the gross weight legal load limits.

- G. When approved by the Engineer in writing, material specified to be measured by volume may be weighed and converted to volume for payment purposes; or material specified to be weighed may be measured by volume and converted to weight for payment purposes. Factors for conversion from weight to volume or vice versa will be determined by the Engineer and shall be agreed to by the Contractor before this method of measurement is used.
- H. Bitumen will be measured by the ton or gallon. Volumes will be measured at 60°F. or will be corrected to the volume at 60°F. using the volume corrections shown in the Department's Construction Manual. Measurements will be made at the delivery point of the material to the Project. Deductions will be made for number of gallons which are neither placed on the road surface nor disposed of as designated by the Engineer.
1. When the bitumen is transported directly from the refinery to the Project in distributor or transport trucks and trailers, each vehicle used shall be weighed before and after loading on scales furnished by the supplier or on public scales accessible to the source; or before and after unloading on the Contractor's scales or on public scales accessible to the work. The scale shall be tested and sealed by a State Agency as often as required by the State in which the scale is located.
  2. Where bitumen is weighed at the source, the tanks shall be sealed by the supplier; and the type of bitumen, specific gravity and the gross, tare, and net weights shall show on the shipment manifest. The shipment manifest shall be signed by a refinery representative or an inspector hired by the Engineer. Truck transports not sealed must be weighed before and after unloading of bitumen at the unloading point.
  3. Bitumen may be measured by the ton and the amount converted to gallons, or it may be measured by the gallon and converted to tons. The conversion factor will be determined from the specific gravity of the material.
  4. The bitumen measured as provided will be paid for at the Contract Unit Price when the material has been tentatively accepted and used, and one of the following conditions exist:
    - a. The original sample of the bitumen meets all requirements of the governing Specifications.
    - b. The original sample of the bitumen may have failed to meet requirements of the governing Specifications, but the check sample meets requirements of the governing Specifications.
    - c. The check sample may fail to meet one quality requirement of the governing Specifications, but it does meet the quality requirement the original sample failed to meet.
  5. For all asphalts except Performance Graded (PG) asphalt, when both samples of bitumen fail to meet any of the governing Specifications except penetration and demulsibility, but the quality deviation is not serious enough to materially affect the work quality, payment for the bitumen will be reduced at a rate of 20% of the invoice price (FOB refinery) per gallon or per ton, for the

quantity of bitumen represented by the failing sample. If more than one of the governing specifications fails to meet the specified requirements, the price adjustment will be based on the lowest pay factor determined.

a. Penetration.

If only the penetration of the bitumen fails to meet the governing Specifications, the following deductions will apply to the invoice (FOB refinery) price for bitumen: (The initial sample and the check sample must fail before a deduct is applied. The percentage of variation will be determined by averaging the penetration of both failing samples.)

<b>Variation of Penetration</b>	<b>Deduct Factor</b>
0.1 – 5%	5%
5.1 – 10%	10%
10.1 – 15%	25%
Greater than 15%	50%

Example:

If the Specifications require an AC 120–150 asphalt cement for the Project and the Engineer determines that the average penetration of the samples is 155.5, the percent variation is calculated as follows:

$$(155.5 - 150) \div 150 = 3.67\% \text{ Variation, the deduct factor is 5\%}$$

If the average penetration is 118.5, the percent variation is calculated as follows:

$$(120 - 118.5) \div 120 = 1.25\% \text{ Variation, the deduct factor is 5\%}$$

b. Demulsibility.

If the demulsibility of the emulsified bitumen fails to meet the governing Specifications, the following deduction will apply to the invoice (FOB refinery) price for bitumen: (The initial sample and the check sample must fail before a deduct is applied. If both samples fail, the percentage of variation will be determined by averaging the demulsibility of both samples.)

$$(\text{Deviation from specified value}) 0.67 = \% \text{ Deduct Factor}$$

6. If the Engineer determines the bitumen has affected the work quality adversely to the extent corrective work is required, no payment will be made for the bitumen.
7. If the tests show the bitumen is not in accordance with the Specifications and the material has not been unloaded, the bitumen will not be accepted.
8. The Engineer reserves the right to weigh any load or loads when delivered to the project.
9. The price adjustments for Performance Graded (PG) Asphalts that fail to meet Section 818.02 A.3. shall be as defined in the *NDDOT Procedure for*

*Acceptance of Performance Graded Bituminous Material.* The *NDDOT Procedure for Acceptance of Performance Graded Bituminous Material* is on file at the Materials and Research laboratory.

- I. Cement will be measured by the ton.
- J. Timber will be measured by the thousand board feet measure. Measurement will be based upon nominal widths and thicknesses and the extreme length of each piece.
- K. The term “lump sum,” when used as an item of payment, will mean complete payment for the work described in the Contract.
- L. When a complete structure or structural unit (in effect, “lump sum” work) is specified as the unit of measurement, the unit shall include all necessary fittings and accessories.
- M. Payment for equipment rental will be made according to rates and instructions listed in the schedule *Rental Rates for Equipment and Traffic Control Devices* published by the Department.
- N. When standard manufactured items are specified, such as fence, wire, plates, rolled shapes, pipe conduit, etc.; and these items are identified by gauge, unit weight, section dimensions, etc.; such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited Specifications, manufacturing tolerances established by industries involved will be accepted.

#### **109.02 SCOPE OF PAYMENT.**

The Contractor shall receive and accept compensation as full payment for furnishing all materials and for performing all work under the Contract in a complete and acceptable manner including all risk, loss, damage, or expense rising out of the nature or prosecution of the work, subject to Section 105.14.

If the “Basis of Payment” clause in the Specifications relating to any unit price in the bid schedule requires that the unit price include and be considered compensation for certain work or material essential to the item, this same work or material will not be measured or paid under any other pay item which may appear elsewhere in the Specifications.

#### **109.03 FREIGHT RATES.**

Changes in carrier rates or in the cost of any other transportation facilities used for the material during the life of the Contract shall not constitute cause for claiming extra compensation.

#### **109.04 FORCE ACCOUNT.**

It is intended that payment under Force Account will be for small scale, additional work as directed in writing by the Department. It is not intended that the Force Account rates and requirements be used as a method for pricing of changed quantity work, dif-

fering site condition work, eliminated items, additional compensation for suspension or delay of work, or request/claim work that falls under Section 104.03 A, B, C; 104.04; 104.05; and 104.06.

- A. **Labor.** The Contractor will be reimbursed for the actual wages and health and welfare benefits paid to all laborers, and all supervisors in direct charge of specific operations, for each hour they are engaged in the Force Account work, but not to exceed any rate of wage agreed to before beginning the work.

In addition, an amount equal to 75% of the wages and health and welfare benefits for Force Account work performed on bridges and reinforced concrete box culvert projects, or 70% of the wages and health and welfare benefits for Force Account work on all other types of projects, will be paid. This amount shall be considered as full compensation for the following items: profit, overhead, pension fund, fringe benefits, bond, insurance, worker's compensation, unemployment insurance, social security taxes, and any other labor additives the Contractor pays. The actual cost paid to, or in behalf of, workers for subsistence and travel allowance will be added to the labor costs. Payment for subsistence and travel must be accounted for on Contractor-submitted payrolls or by certified letter. The labor additive rate specified above will not be applied to the subsistence and travel allowance.

- B. **Materials.** For all materials accepted by the Engineer and permanently installed into the work, the actual cost (including transportation charges paid by the Contractor) of the material delivered will be paid, to which a sum equal to 15% will be added. For materials used in connection with (but not entered permanently into) the work, a reasonable depreciation will be allowed.
- C. **Equipment.** Payment for use of authorized equipment and additional traffic control devices required by the Force Account work will be based on rental rates determined according to the then current issue of the Department publication entitled *Rental Rates for Equipment and Traffic Control Devices*. This publication shall constitute a part of this Specification. Rates determined shall be agreed to in writing on the standard agreement form furnished by the Department. No percentage will be added to these rates.

Procedures governing rented or owner-operated equipment, attachments and accessories, types and quantity of equipment, measurement of equipment time, use of equipment in excess of 50 hours per week, stand-by time, and equipment transportation charges will be as set forth in the Department's publication *Rental Rates for Equipment and Traffic Control Devices*.

- D. **Miscellaneous.** No additional allowance will be made for use of small tools not listed in the rental rate schedule or other costs for which no specific allowance has been provided.
- E. **Subcontracting.** For any Force Account work performed by a Subcontractor with the written authorization of the Engineer, the Contractor will receive an additional allowance for administrative and overhead expense. The additional allowance will be a percentage of the Force Account work performed by the Subcontractor equal to 10% of the first \$15,000 plus 5% of the balance in excess of \$15,000.
- F. **Authority of Engineer.** The Engineer has authority to require alterations in equipment and labor force assigned to Force Account work. The Engineer is

authorized to limit overtime work to that normally used on the project for work of similar nature, to require overtime when an emergency exists, and to require the stopping of Force Account work when adverse conditions limit productivity.

- G. **Daily Records.** Each day the Contractor's representative and the Engineer shall compare and reconcile the records of labor, materials, and equipment used in the Force Account work.
- H. **Statements.** The Contractor shall furnish the Engineer with duplicate itemized statements of the cost for the Force Account work, detailed as follows:
  1. Payroll for laborers and foreman.
  2. Quantities of materials, prices, extensions, and transportation costs paid by the Contractor.

Statements shall be accompanied by paid receipted invoices for materials used, including transportation charges paid by the Contractor. The statements shall be adjusted when applicable to reflect any discounts offered by the supplier. If materials used in the Force Account work are not specifically purchased but are taken from the Contractor's stock, an affidavit shall be furnished certifying that the materials were taken from stock, that the quantity claimed was actually used, and that the price and transportation costs claimed are the Contractor's actual costs. After receipt of statements and invoices, the Engineer will prepare a summary statement of the Force Account work which will be submitted to the Contractor for verification and signature. The value of the Force Account work covered by approved statements will be included in progressive estimates.

- I. **Compensation.** Compensation provided by previous provisions of this Section shall be accepted by the Contractor as payment in full for work performed on a Force Account basis.
- J. **Specialty Work.** When a special service or item of work cannot be performed by the Contractor or authorized Subcontractors, the service or Extra Work item may be performed by a specialist. Invoices for the work may be based on current market price without complete itemization of labor, material, and equipment cost when it is not practicable and not according to established practice of the special service industry to provide complete itemization. To compensate for administrative and overhead costs, an allowance will be added to the speciality work invoice equal to 10% of the first \$5,000 plus 3% of the balance in excess of \$5,000.
- K. **Payment.** Force Account payments will be made within 30 days after receiving all the required information.

#### **109.05 PARTIAL PAYMENT.**

Partial payment will be made at least once each month as the work progresses. Payments may be made twice a month or more often if the Engineer determines the amount of work performed is sufficient to warrant such payment. Payments will be based on estimates prepared for the value of the work performed, and for materials delivered according to Section 109.06.

Failure to perform any of the obligations under the Contract will be considered adequate reason for withholding any payments until compliance is achieved.

From the total amounts payable, 4% of the whole will be deducted and retained by the Department. The balance of 96%, less all previous payments, will be certified for payment. After 50% of the work has been completed, the Department may make any remaining partial payments in full as long as 2% of the total Contract price is retained.

After 90% of the work has been completed and:

- 1) all pit releases, receipts of payment, and haul road releases are on file with the Department; and
- 2) all payrolls have been submitted and are up to date; and
- 3) the remaining work can be completed without accrual of liquidated damages; and
- 4) the Contractor is making a diligent effort to complete the work remaining on the project;

the Engineer may prepare a semifinal estimate for the work completed and retain not less than 1% of the dollar amount of work completed. The remainder, less all previous payments, will then be certified for payment.

After all original Contract work is completed and conditions 1) through 4) above have been met, the Engineer may prepare a semifinal estimate for the work completed and retain less than one percent of the dollar amount of work completed. The actual amount of retainage must be approved by the Construction Engineer.

#### **109.06 PAYMENT FOR MATERIAL ON HAND.**

Non-perishable and perishable material, including freight charges, which meet Specification requirements and which are produced or purchased for incorporation into Contract Items of work may be paid for if stockpiled in the vicinity of the Project or stored in acceptable locations approved by the Engineer. All material must be stored within the boundaries of the state of North Dakota to be eligible for payment. In addition, perishable material must be stored in an approved storage facility, and, if required by the Engineer, recertified by the Contractor before being incorporated into the Project.

Payments authorized shall not constitute final acceptance of the material and the Contractor shall be responsible for such materials. Payment for material does not relieve the obligations under the terms of the Contract to furnish and incorporate the material into the work according to the Specifications. Payment for materials under this Section will not be made unless a paid invoice for materials, or in the case of Contractor produced material, a fully documented statement of production costs, is submitted to the Engineer. This statement shall include: (a) type of material; (b) amount of material stockpiled; (c) location of stockpile; and (d) itemized breakdown of the cost for producing the material.

To be eligible for payment, the value of the delivered material to be used in one item of work must exceed \$1,000.00 and must not be scheduled for incorporation into the work for 30 days after delivery.

Payment for material on hand will be limited to the appropriate portion of the value of the Contract item and will not exceed the Contract Unit Price for the work item in

which the material is used. Payment will not be made for materials in excess of Plan quantities.

Aggregates stockpiled at a commercial source will be eligible for payment if:

1. All requirements listed above are adhered to.
2. The location of the stockpiled material is approved by the Engineer.
3. The Prime Contractor accepts total responsibility for the stockpiled material paid for on the estimate, and rectifies any discrepancies in quantity or quality at no cost to the Department.

Removal of any of the stockpiled material by the Contractor for use on other projects, before the project for which the material was produced is completed, will constitute Default of Contract.

#### **109.07 COMPENSATION FOR ALTERED QUANTITIES.**

When the accepted quantities of work vary from the quantities in the bid schedule, the Contractor shall accept as payment in full, so far as Contract items are concerned, payment at the original Contract Unit Price for the accepted quantities of work done. No allowance except as provided in Section 104.03 will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor, whether resulting directly from alterations in the work or indirectly from unbalanced allocation of overhead expenses among the Contract items or from any other cause.

#### **109.08 ACCEPTANCE AND FINAL PAYMENT.**

When the Project has been accepted as provided in Section 105.13, the Engineer will prepare the final estimate for work performed. After approval of the final estimate by the Contractor, the entire sum due will be paid after deducting all previous payments and all amounts owed to the Department or to be retained or deducted under the Contract provisions.

All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The Contractor may be required to furnish proof of compliance with all laws which directly or indirectly apply to the work before any partial or final payment is made.

#### **109.09 CONVERSION TO METRIC SYSTEM.**

The transportation industry is moving toward adoption of the Metric System, also known as the International System of Units (SI). AASHTO has officially endorsed such action, and uses the Metric System to establish standard sieve sizes in AASHTO Specification M-92.

Some applicable conversion factors are as follows:



<b>To Convert From</b>	<b>To</b>	<b>Multiply By</b>
Inch	Metre (m)*	.0254 or $2.54 \times 10^{-2}$
Foot	Metre (m)	.3048 or $3.048 \times 10^{-1}$
Foot <sup>2</sup>	Metre <sup>2</sup> (m <sup>2</sup> )	.092903040 or $9.2903040 \times 10^{-2}$
Yard <sup>2</sup>	Metre <sup>2</sup> (m <sup>2</sup> )	.836127360 or $8.36127360 \times 10^{-1}$
Foot <sup>3</sup>	Metre <sup>3</sup> (m <sup>3</sup> )	.028316847 or $2.8316847 \times 10^{-2}$
Yard <sup>3</sup>	Metre <sup>3</sup> (m <sup>3</sup> )	.764554858 or $7.64554858 \times 10^{-1}$
Pound (Mass)	Kilogram	.453592370 or $4.53592370 \times 10^{-1}$
Gallon (U.S.)	Metre <sup>3</sup> (m <sup>3</sup> )	.003785411784 or $3.785411784 \times 10^{-3}$
Metre	Inch	39.37007874
Metre	Foot	3.280839895
Metre <sup>2</sup> (m <sup>2</sup> )	Foot <sup>2</sup>	10.76391042
Metre <sup>2</sup> (m <sup>2</sup> )	Yard <sup>2</sup>	1.195990046
Metre <sup>3</sup> (m <sup>3</sup> )	Foot <sup>3</sup>	35.31466621
Metre <sup>3</sup> (m <sup>3</sup> )	Yard <sup>3</sup>	1.307950619
Kilogram	Pound (Mass)	2.204622622
Metre <sup>3</sup> (m <sup>3</sup> )	Gallon (U.S.)	264.172052

Additional information and conversion factors can be found in AASHTO Specification R1 or ASTM E 380.

\*The spelling "metre" is preferred by AASHTO, although "meter" is widely used.

## SECTION 110 ENVIRONMENTAL PROTECTION

### 110.01 DESCRIPTION.

This work consists of operational controls to be practiced and temporary pollution control measures to be taken to aid in controlling erosion and water pollution resulting from construction operations.

Temporary erosion and pollution control measures to be taken shall be those shown on the Plans, proposed by the Contractor and approved by or ordered by the Engineer during the life of the Contract. The work shall provide prevention, control, and abatement of water pollution through the use of berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion and pollution control measures shall be coordinated with permanent erosion control features specified elsewhere in the Contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

Temporary pollution control may include construction work outside the Right of Way where roadway associated construction is necessary. This includes borrow pit operations, haul roads, equipment storage sites, and plant sites.